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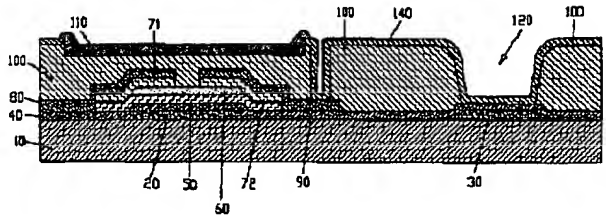
TITLE : THIN FILM TRANSISTOR SUBSTRATE FOR LIQUID CRYSTAL DISPLAY DEVICE, ITS PRODUCTION, AND LIQUID CRYSTAL DISPLAY DEVICE



ABSTRACT : PROBLEM TO BE SOLVED: To reduce the orientation defect of liquid crystal and to raise the numerical aperture.

SOLUTION: After a pixel electrode 140, is formed by rotatively coating a flattened flowable insulating film 100 acting as a protective film on a substrate 10, a part of the protective film 100 on a thin film transistor is etched and an organic back photoresist is packed in an etched part to form a black matrix 110. Enough holding capacity is secured by removing the protective film 100 on a holding capacity electrode 30 or forming a metallic film thereon. By using a double-layered film composed of the flowable insulating film and a silicon nitride film as a gate insulating film 41, excellent electric characteristics can be obtained when the substrate is flattened. When the thin film transistor of an etching stopper system is used, parasitic capacity between a gate electrode 20 and a drain electrode 90 can be reduced thereby a process can be simplified by forming an etching stopper layer 60 of an organic insulating film capable of executing a photographic process.